SB761
U7N6
#71-39

U.S. FOREST SERVICE

NORTHERN REGION

DIVISION OF STATE AND PRIVATE FORESTRY

INSECT AND DISEASE REPORT

Report No. 71-39

5200
November 1971

AN AID TO THE IDENTIFICATION OF DWARF MISTLETOE SPECIES IN THE NORTHERN REGION

by

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Dwarf mistletoes (Arceuthobium spp.) are the most important disease organisms within the Northern Region. Information concerning damage and control is covered in a previous report.1/

Five dwarf mistletoe species infect 11 native and four introduced tree species within the Region. A. americanum on lodgepole pine, A. douglasii on Douglas-fir, and A. laricis on western larch cause appreciable damage; the other dwarf mistletoe - host combinations are mainly of academic interest. Identification of the dwarf mistletoe species present and the relative amount of damage it is causing should be known before a decision is made for control.

The following information has been compiled to aid in identification of these dwarf mistletoe species.

DWARF MISTLETOE SPECIES PRESENT

A. americanum, the lodgepole pine species.
A. douglasii, the Douglas-fir species.
A. laricis, the western larch species.
A. campylopodum, the ponderosa pine species.
A. cyanocarpum, the limber pine species.

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EXPERIMENT STATION

1/ Dooling, O. J. Dwarf mistletoe in the Northern Region. Forest Insect and Disease Report, Division of State and Private Forestry, 1971.

HOSTS, BY DWARF MISTLETOE SPECIES

In the listing below, the host trees are followed by two letters in brackets that show: first, the host susceptibility and infection factor; and, second, the relative amount of damage that specific dwarf mistletoe species causes on the host. Infection factor is defined as the percentage of trees, by tree species, that are infected within 20 feet of heavily infected principal hosts.

Host susceptibility and infection factor

		Percent
P	-principal	90 - 100
S	-secondary	50 - 90
O	-occasional	5 - 50
R	-rare	0 - 5

Relative damage

H	-high
M	-moderate
L	-low
U	-unimportant or unknown

A. americanum

Lodgepole pine	(P)	(H)
Ponderosa pine	(O)	(L)
Whitebark pine	(R)	(U)
Limber pine	(R)	(U)
Scotch pine *	(R)	(U)
Engelmann spruce	(R)	(U)

A. douglasii

Douglas-fir	(P)	(H)
Engelmann spruce	(R)	(U)

A. laricis

Western larch	(P)	(H)
Lodgepole pine	(S)	(M)
Subalpine fir	(O)	(M)
Grand fir	(O)	(L)
Ponderosa pine	(O)	(L)
Mountain hemlock	(O)	(M)
Engelmann spruce	(R)	(U)
Western white pine	(R)	(U)
Norway spruce *	(R)	(U)

* Introduced species

A. laricis (continued)

Jack pine *	(R)	(U)
Red pine *	(R)	(U)
Scotch pine *	(R)	(U)

A. campylopodum

Ponderosa pine	(P)	(L)
Lodgepole pine	(O)	(L)

A. cyanocarpum

Limber pine	(P)	(U)
Whitebark pine	(O)	(U)
Ponderosa pine	(R)	(U)

DWARF MISTLETOE SPECIES, BY HOSTS

Lodgepole pine

A. americanum
A. laricis
A. campylopodum

Ponderosa pine

A. americanum
A. laricis
A. campylopodum
A. cyanocarpum

Whitebark pine

A. americanum
A. cyanocarpum

Limber pine

A. americanum
A. cyanocarpum

Scotch pine

A. americanum
A. laricis

Jack pine

A. laricis

Red pine

A. laricis

Western white pine

A. laricis

Douglas-fir

A. douglasii

Engelmann spruce

A. laricis
A. americanum
A. douglasii

Norway spruce

A. laricis

Subalpine fir

A. laricis

Grand fir

A. laricis

Western larch

A. laricis

Mountain hemlock

A. laricis

BRANCHING HABIT

Careful examination of the dwarf mistletoe plant will show the side branches and leaves arranged in one of two definite ways: (1) paired at the same height, one on each side - opposite; (2) more than two at the same node - whorled.

A. americanum - branches in whorls.
A. laricis - branching opposite.
A. douglasii - branching opposite.
A. campylopodum - branching opposite.
A. cyanocarpum - branching opposite.

SEASON OF FLOWERING

A. americanum - spring.
A. douglasii - spring.
A. laricis - late summer.
A. campylopodum - late summer.
A. cyanocarpum - late summer.

RANGE OF DWARF MISTLETOE SPECIES

A. americanum - botanical range of lodgepole pine.
A. douglasii - botanical range of Douglas-fir, west of Continental Divide.
A. laricis - botanical range of western larch.
A. campylopodum - northeastern Washington south of Colville National Forest, and in Idaho west of Coeur d'Alene to Washington State line.
A. cyanocarpum - botanical range of limber pine, scattered.

KEY TO SPECIES OF DWARF MISTLETOE

The following key is based on the more readily determined characteristics of the dwarf mistletoe plants. Since the host is usually known, the key is written by hosts. Season of flowering is not used because of the relatively short time the flowers are present.

KEY

1. Lodgepole pine

    A. Branching pattern in whorls - A. americanum.

    AA. Branching pattern opposite.

        B. Small aerial plants, seldom exceeding 2 inches in length - A. laricis.

        BB. Large aerial plants, usually exceeding 4 inches in length - A. campylopodum.

2. Ponderosa pine

   A. Branching pattern in whorls - A. americanum

   AA. Branching pattern opposite.

      B. Large aerial plants, usually exceeding 4 inches in length - A. campylopodum.

      BB. Small aerial plants, seldom exceeding 2 inches in length.

         C. Western larch growing in stand - A. laricis.

         CC. Limber pine growing in stand - A. cyanocarpum.

3. Whitebark pine

   A. Branching pattern in whorls - A. americanum.

   AA. Branching pattern opposite - A. cyanocarpum.

4. Limber pine

   A. Branching pattern in whorls - A. americanum.

   AA. Branching pattern opposite - A. cyanocarpum.

5. Scotch pine

   A. Branching pattern in whorls - A. americanum.

   AA. Branching pattern opposite - A. laricis.

6. Jack pine

   A. laricis

7. Red pine

   A. laricis

8. Western white pine

   A. laricis

9. Douglas-fir

   A. douglasii

10. Engelmann spruce

    A. Branching pattern in whorls - A. americanum.

    AA. Branching pattern opposite.

        B. Extremely small aerial plants, seldom exceeding one-half inch in length - A. douglasii.

        BB. Larger aerial plants, one to two inches in length - A. laricis.

11. Norway spruce

        A. laricis

12. Subalpine fir

        A. laricis

13. Grand fir

        A. laricis

14. Western larch

        A. laricis

15. Mountain hemlock

        A. laricis